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ABSTRACT

A program to expand and improve magnet schools in the Austin Independent School District (AISD) was funded by the U.S. Department of Education in 1985-1986. Results of the program were: (1) increased and more stable enrollments in magnet elementary schools; (2) large achievement gains in reading, mathematics and science for students in a high school science magnet program; (3) increased enrollment at a magnet desegregated high school; (4) less overcrowding in nonmagnet elementary schools; (5) an increase in the number of students enrolled in honors courses at the magnet high school; and (6) positive student evaluations of the magnet science academy. Program outcomes which caused some concern were: (1) a transfer policy which restricted the acceptance of many students to the magnet foreign language program; (2) the lack of applications from minorities and females in the science program on par with their representation in the district; and (3) the lack of significant progress in developing a science magnet curriculum at the elementary school level. This report provides graphic presentations of statistical data including allocation of the grant and details of per pupil expenditures. (VM)

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MAGNET SCHOOL ASSISTANCE PROGRAM

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Grant Application for FY 1985-86

85.42

EXECUTIVE SUMMARY

MAGNET SCHOOL ATTRACTIONS: MAGNET SCHOOLS ASSISTANCE PROGRAM, 1985-86

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MAJOR POSITIVE FINDINGS:

1. Magnet programs have helped to stabilize enrollment at the elementary campuses over the last three years. At all six magnet schools, enrollment increased during either the first or second year of the program.

2. Science Academy students made large achievement gains in reading, mathematics, and science. Ninth-grade students made larger gains than similar, high-achieving students districtwide in reading and science; tenth-grade students made larger gains than similar students in mathematics.

3. After steady declines since desegregation began, enrollment at LBJ High School increased 14% in 1985-86, the first year of the Science Academy.

4. Elementary programs have been successful in attracting transfer students from overcrowded South Austin schools.

5. The number of students enrolled in honors courses at LBJ increased 55% as a result of transfers to the Science Academy. Enrollment at other campuses was not significantly affected by the loss of transfer students.

6. Eighty-six percent of the Science Academy students reported that they would encourage other interested students to apply.

MAJOR FINDINGS REQUIRING ACTION

1. The Murchison Foreign Language Program was unable to accept many potential transfer students because of transfer policy restrictions.

2. Although minorities and females were accepted into the Science Academy at rates comparable to their representation in the pool of applicants, more need to be encouraged to apply in order to obtain enrollment rates on parity with the District ethnic and gender distributions.

3. While efforts were made toward the objective of coordinating a K-12 science magnet curriculum, no significant progress was made at the elementary level. Progress was made toward articulating the secondary science magnets' curricula.

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GENERAL OVERVIEW

WHAT ARE MAGNET SCHOOLS?

Magnet schools have a theme or curricular focus designed to provide alternatives to or enrichment of the regular District curriculum. Magnet schools typically are open for enrollment by any student in the District wishing to attend, rather than only by students in the school's attendance area. Magnet schools in AISD offered programs that were campuswide or based upon the school-within-a-school concept.

The magnet school programs in the Austin Independent School District were supported by a one-year grant for 1985-86 from the Department of Education under the Education for Economic Security Act, Magnet Schools Assistance Program. The grant provided funds for the expansion and improvement of programs at six elementary schools and for the implementation of a junior high school foreign language magnet program and a high school science-math-technology magnet program.

According to the grant proposal, the stated objectives of the magnet programs were: 1) to improve the overall enrollment as well as the ethnic balance at the magnet campuses, 2) to provide educational alternatives through the enriched curriculum and to increase interest, knowledge, and understanding of students in the content areas of focus, and 3) to increase educational opportunities for traditionally underrepresented populations (e.g., minorities and females).

Figure 1 illustrates how the federal grant was distributed among the programs and for administration and evaluation.

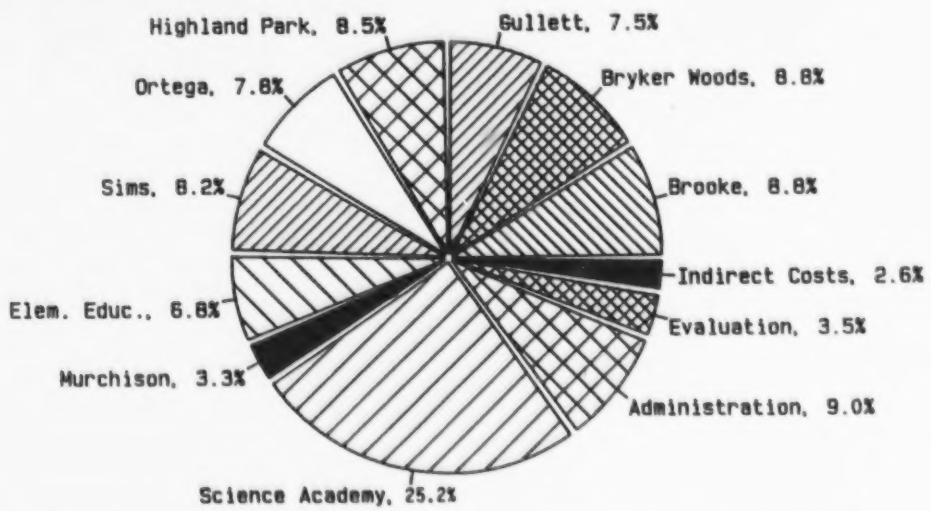


Figure 1. DISTRIBUTION OF MAGNET FUNDS TO CAMPUSES AND ADMINISTRATION, 1985-86

Elementary Total = $543,286
Secondary Total = $274,676
Admin/Eval/Indirect = $145,988

The figure below presents a brief description of each magnet program offered in AISD.

BROOKE (K, 4-6): Fine Arts/Humanities. The objective of the fine arts/humanities magnet was to integrate fine arts with the essential elements, that is, to express the curriculum through music, art, or drama. All students received fine arts enrichment through the classroom teacher, the campus fine arts coordinator, and by attendance at performances or special events and by participation in activities offered by visiting or part-time teachers.

BRYKER WOODS (K-3): Outdoor Education/Environmental Study. All students received enriched science instruction from a magnet science teacher four days a week on a rotating schedule by grade level. Emphasis was on natural science field and laboratory studies which made use of the outdoor classroom and environmental resources.

GULLETT (4-6): Science/Computers. Students were selected for admission into the magnet program at Gullett. A variety of modules, primarily in science and computers, were offered throughout the year. Students took one module each four-week session in a 45 minute after-school period four days a week.

HIGHLAND PARK (K-3): Science/Computers. All students received enriched instruction in science through hands-on experience in the Outdoor Learning Center with the guidance of a magnet science lab teacher. Teachers also took their classes to a computer laboratory for instruction or drill and practice.

ORTEGA (K, 4-6): Humanities Via Literature and Social Studies. Special emphasis was placed on the humanities and social studies curriculum as a means of integrating the entire curriculum. Lessons and concepts were reinforced or expanded through social studies activities and field trips.

SIMS (1-3): Science, Computers, Fine Arts. All first through third graders were provided with enrichment activities in science, computers, dance, and drama. Each grade level participated in science, drama, or dance enrichment during three ten-week trimesters on a rotating basis. Computer instruction was offered to all students, including kindergarteners, throughout the year.

MURCHISON (7-8): Foreign Languages. Students had a choice of learning one or more languages from among four offered: French, German, Latin, and Spanish. Language instruction was designed to be supplemented through the use of computer and video equipment placed in the language classroom. Students were exposed to language and cultural experiences through a variety of instructional materials and media.

LBJ (9-11): Science Academy of Austin. Students with an interest in science and the motivation to participate in an enriched science program were selected for the science magnet program. Students took extra math and science courses and had the opportunity to work with computers and laboratory science equipment, including an electron microscope.

Figure 2. MAGNET SCHOOL PROGRAMS IN THE AUSTIN INDEPENDENT SCHOOL DISTRICT

HOW WERE THE ELEMENTARY MAGNET PROGRAMS IMPLEMENTED?

Implementation of the elementary magnet programs began in the 1982-83 school year at four campuses and in 1983-84 at Brooke and Ortega. During 1985-86, enhancement of the programs was assisted by a variety of activities and resources supported by grant funds, such as curriculum development, staff development, field trips, and through the acquisition of equipment, instructional supplies, and resource materials.

In addition to the general objectives listed in the introduction, each program emphasized different content areas and curricula with concomitant objectives. The grant proposal also stated additional common objectives for the elementary programs:

- To contribute to the enrichment of the regular District curriculum in basic academic areas offered at the magnet campuses,
- To improve District curriculum in content areas offered by magnet schools by using magnet campuses as model demonstration sites,
- To develop a districtwide elementary magnet science curriculum to interface with the secondary science magnet program, and
- To develop two models for magnet school programs in the humanities, one with a literature/fine arts emphasis, the other with a literature/social studies focus.

Each of the six elementary campuses had a different emphasis. The magnet program at each campus offered enrichment in the curricular areas of focus, which was designed to supplement, not supplant, the District's regular curriculum in those areas.

WHO WAS SERVED?

Figure 3 indicates the percentage of students by ethnicity and gender served by the magnet programs in AISD for the school year 1985-86.

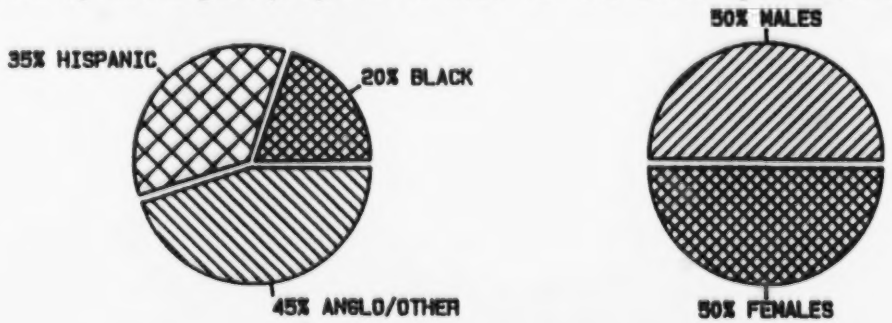


Figure 3. ELEMENTARY MAGNET STUDENTS: ETHNICITY AND SEX CHARACTERISTICS.

Figure 4 presents the student characteristics by school, including the percentage of students who were eligible for the free or reduced-price lunch program. The enrollment figures were obtained from the Average Daily Membership Report for the first six weeks, and the percent low-income was taken the last day of school, June 3, 1986. At Gullett and Sims, where not all students attending the school were participants, the figures presented were based only on students in the magnet program.

SCHOOL	ETHNICITY			SEX		PERCENT	STUDENTS
	BLK	HSP	A/O	MALE	FEMALE	LOW INCOME	SERVED
BROOKE	4%	69%	27%	54%	46%	55%	325
BRYKER WOODS	33%	15%	52%	49%	51%	32%	224
GULLETT	8%	5%	87%	57%	43%	6%	165
HIGHLAND PARK	2%	35%	63%	52%	48%	28%	382
ORTEGA	22%	46%	32%	46%	54%	55%	307
SIMS	62%	13%	25%	45%	55%	58%	212

Figure 4. ETHNICITY, SEX, LOW-INCOME STATUS, AND ENROLLMENT OF STUDENTS SERVED IN ELEMENTARY MAGNET PROGRAMS.

WHO TRANSFERRED TO THE PROGRAMS?

Participation in the elementary magnet programs via voluntary transfer to a magnet campus was open to all students districtwide who were eligible to transfer under the stipulations of the District's transfer policy. Essentially, a student was not eligible if he/she was reassigned for desegregation or if the student was in the minority ethnic group at the home school. The program at Gullett required students to submit an application and to be tested and screened before being admitted to the program. Once admitted, a student's transfer request was approved.

One indication of a magnet school's attracting power is the number of transfers granted to students for the magnet program relative to the number of transfers granted for all other reasons.

Figure 5 on the following page indicates the total number of transfers, and the proportion of the total represented by magnet transfers for each campus during 1985-86 as an indication of each program's attracting power.

1985-86 TRANSFERS TO ELEMENTARY MAGNET SCHOOLS

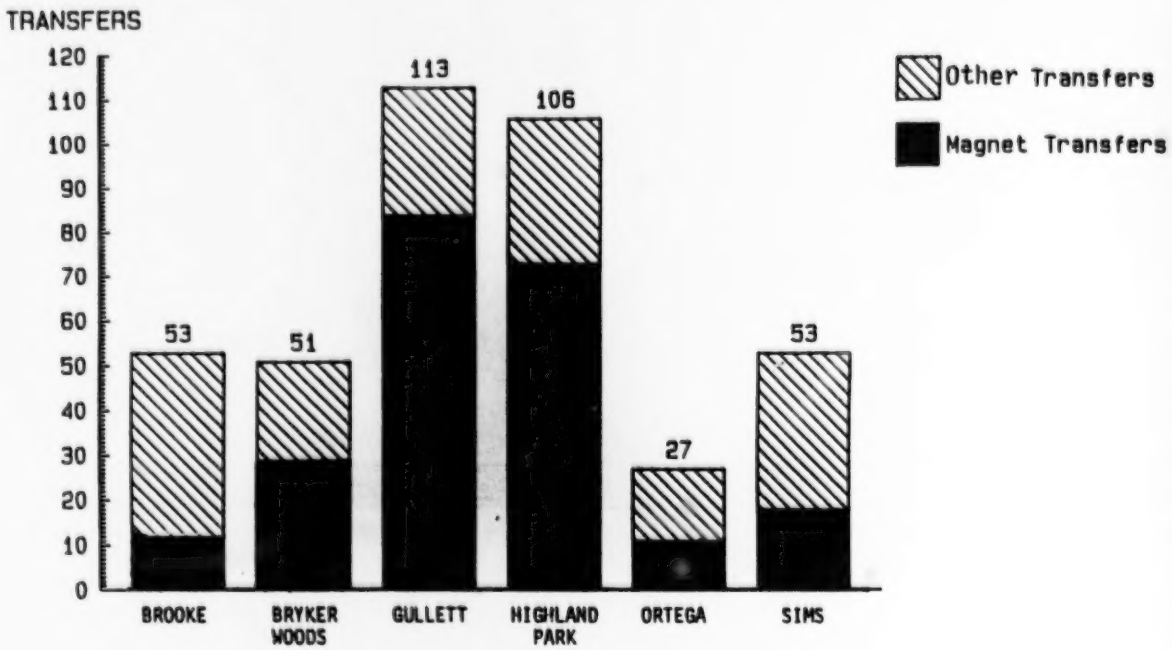


Figure 5. ELEMENTARY MAGNET TRANSFERS AS PORTION OF TOTAL TRANSFERS.

In order to examine the drawing power of the magnet programs on students of the three major ethnic groups, the percentage of total transfers was calculated for each group. The number of magnet transfers within each ethnic group and the percentage of the total transfers represented by the magnet transfers were also found. The schools were grouped according to their pre-desegregation status, either minority-dominant or Anglo-dominant.

	TOTAL TRANSFERS (Percent of Total)			MAGNET TRANSFERS (Percent of Ethnic Group)		
	BLK	HSP	A/O	BLK	HSP	A/O
Formerly Minority-Dominant:						
Brooke	5 (9%)	34 (64%)	14 (26%)	2 (17%)	2 (17%)	8 (66%)
Ortega	4 (15%)	9 (33%)	14 (52%)	0 (0%)	1 (9%)	10 (91%)
Sims	33 (62%)	2 (4%)	18 (34%)	7 (39%)	0 (0%)	11 (61%)
Formerly Anglo-Dominant:						
Bryker Woods	3 (6%)	2 (4%)	46 (90%)	1 (3%)	2 (7%)	26 (90%)
Gullett	23 (20%)	7 (6%)	83 (73%)	14 (17%)	5 (6%)	65 (77%)
Highland Park	7 (7%)	25 (23%)	74 (70%)	6 (8%)	8 (11%)	59 (81%)

Figure 6. ETHNIC COMPOSITION OF TRANSFER STUDENTS AT MAGNET CAMPUSES.

With respect to total transfers, the formerly minority-dominant schools received mostly minority transfer students (except Ortega where minority and non-minority transfers were nearly equal). However, with respect to magnet transfers, the programs were being successful in attracting Anglo students voluntarily to those campuses where Anglo students were in the minority.

The transfers to formerly Anglo-dominant schools consisted predominantly of Anglo students (70% to 90%). Anglo students had a slight majority at those campuses in 1985-86, because Anglos were being drawn from overcrowded south Austin schools, which were predominantly Anglo.

WHAT WAS THE COST PER PUPIL FOR THE ELEMENTARY PROGRAMS?

Funding for the programs came primarily from the federal grant; however, local funds were allocated for partial program support and for the transportation of transfer students residing outside the attendance area to and from the campuses and for field trips.

Capital outlay allocations represented a substantial portion of the funds in some cases. Therefore, a useful life expectancy of five years was assumed for capital outlay assets in order to figure the one-year depreciation value. One-fifth of the capital outlay funds was added to all remaining funds and then divided by the number of students to obtain a more realistic picture of the per-student-cost for each program.

All calculations were based on the grant and local funds allocated and not on the amounts actually expended. The number of students was based on the average daily membership for the first semester. Transportation costs were based on the number of transfer students who requested bus service. Because Gullett had after-school activities, most magnet students needed transportation home. **The District provided transportation to 184 elementary magnet transfer students at a per-pupil cost of $1,937.73 for a total of $356,542.**

Figure 7 below presents the cost for instructing each magnet student over and above the regular cost for instruction at each campus. Costs are distributed according to the local and federal funding sources in order to identify the actual cost to the District. The per-pupil costs have been adjusted downward to reflect the depreciation of capital outlay assets over a five-year lifespan. One-fifth of the capital outlay funds were added to all other funds allocated to calculate the adjusted magnet costs. Capital outlay expenses are typically initial costs which do not continue throughout the life of a program. The costs associated with the local magnet funds represents costs over and above the per pupil amount expended by AISD for regular instruction.

	BROOKE	BRYKER WOODS	GULLETT	HIGHLAND PARK	ORTEGA	SIMS
STUDENTS	325	224	160	382	307	212
LOCAL MAGNET FUNDS:	$16,355.00	11,900.00	28,750.00	14,370.00	18,250.00	24,800.00
FEDERAL MAGNET FUNDS:	$84,380.00	85,170.00	71,876.00	81,600.00	75,380.00	79,450.00
ADJUSTED MAGNET COSTS:						
LOCAL:	$ 49.09	53.13	179.69	36.78	59.45	116.98
FEDERAL:	$ 185.73	270.32	270.40	136.29	245.53	354.01
TOTAL MAGNET COST PER PUPIL:	$ 234.82	323.45	450.09	173.07	304.98	470.99

Figure 7. ELEMENTARY MAGNET SCHOOL PROGRAM COSTS ACCORDING TO LOCAL AND FEDERAL GRANT FUNDING SOURCES.

The 1986-87 magnet grant proposal did not request funds for the elementary programs to continue except for some partial partnerships with the secondary programs. Therefore, without federal funds and in the face of significant local revenue shortfalls, the cost efficiency of these programs must be considered when making decisions about whether or not to continue local funding.

With the new equipment and materials purchased with grant funds available for 1986-87, the programs should be able to function sufficiently well with reduced funds. Without transportation, however, the programs would be able to offer an enriched curriculum only to the students assigned to the school or to those who provided their own transportation.

HOW WAS THE FOREIGN LANGUAGE PROGRAM IMPLEMENTED?

Foreign language instruction in French, German, Latin, and Spanish was offered at Murchison as a way of providing a language-cultural center not available at other Austin junior high schools. Language instructional materials, including computers and video equipment were to be available to the teachers and students.

The foreign language magnet equipment was not received until the end of the school year or during the summer. Computer and video equipment was not installed in time for use during 1985-86; however, a variety of new supplemental instructional materials purchased with grant and local funds were available on time.

WHO WAS SERVED?

Murchison attracted many more transfer requests than were accepted. The restrictions imposed by the District's transfer policy on eligibility left few students qualified to transfer to Murchison. To qualify, the student must have been eligible under the stipulations of the transfer policy. In addition, the language of choice must not have been available at the home school.

Nine students, five females and four males, received approval for magnet transfers to Murchison during 1985-86, which included two Blacks, three Hispanics, and four Anglo/Other students. While these nine were the only students from outside the Murchison attendance area, many more students in the foreign language classes received services with the magnet instructional methods and materials. The following figure shows the actual enrollment in the eight foreign language classes each semester of the one-year courses.

COURSE	GRADE	1ST SEM	2ND SEM	COURSE	GRADE	1ST SEM	2ND SEM
French	(Gr 7)	29	26	Latin	(Gr 7)	7	7
French	(Gr 8)	8	8	Latin	(Gr 8)	5	5
German	(Gr 7)	16	16	Spanish	(Gr 7)	52	94
German	(Gr 8)	6	5	Spanish	(Gr 8)	39	21
TOTAL BY SEMESTER:						**162**	**182**

Figure 8. FOREIGN LANGUAGE CLASS ENROLLMENT, 1ST AND 2ND SEMESTERS, 1985-86.

Figure 9 below presents the ethnic, sex, and low-income characteristics of students who were considered to be magnet students, based on the average number of students enrolled in foreign language classes.

ETHNICITY			SEX		PERCENT
BLACK	HISPANIC	OTHER	MALE	FEMALE	LOW-INCOME
12	56	103	73	98	53
7%	33%	60%	43%	57%	31%

Figure 9. FOREIGN LANGUAGE MAGNET STUDENT CHARACTERISTICS

WHAT WAS THE COST PER PUPIL FOR THE FOREIGN LANGUAGE PROGRAM?

The capital outlay allocation was separated out of both the local and federal magnet funds for figuring per-pupil costs. The capital outlay amounts accounted for 68% of the federal funds and none of the local funds. The one-year depreciation value of capital outlay assets was calculated based on a five year useful life expectancy. One-fifth of the capital outlay allocation was added back into all other funds for the "total allocation" for each funding source. The cost-per-pupil represents the amount allocated for magnet students, based on the average number served throughout the year. The costs associated with the local magnet fund allocation represent expenses over and above the per pupil costs incurred by the District for regular instruction. Because only one transfer student requested transportation, the Office of Student Transportation considered the cost negligible and did not calculate the cost for magnet transportation.

SOURCE	ALLOCATION	STUDENTS SERVED	COST PER MAGNET PUPIL
Local	$22,000	172	$127.91
Federal	$31,865	172	$ 84.49
TOTAL	**$53,865**	**172**	**$212.40**

Figure 10. FOREIGN LANGUAGE MAGNET PER-PUPIL COST BASED ON BUDGET ALLOCATIONS.

Because the capital outlay portion of the federal budget was so large ($21,665), the adjusted budget on which the cost-per-magnet-pupil was based was actually $14,533 after depreciation was calculated. Therefore, the cost-per-pupil is less than what a simple division procedure would yield.

The program was actually more expensive than these figures reveal. Some of the language classes were quite small. Classes with smaller pupil-teacher ratios are more expensive on a per-pupil basis than full-capacity classes. Therefore, there were some hidden costs that increased the per-pupil cost for the program which were not calculated.

HOW WAS THE SCIENCE ACADEMY MAGNET PROGRAM IMPLEMENTED?

Program objectives of the Science Academy included: 1) to serve as a District and national implementation and dissemination model for exemplary instructional practices in science, mathematics, and computer science, and 2) to coordinate the development of a K-12 District science curriculum.

In 1985-86, the first year of implementation, 115 ninth- and 41 tenth-grade students and a few eleventh graders were enrolled. Eventually, the program will expand to include approximately 200 students in each of four grade levels. Students admitted to the Science Academy enrolled in an extra course offered during a "zero hour" period (before the official start of the school day). These courses were usually mathematics or science taught by a Science Academy teacher. Students also had additional mathematics, science, or computer classes with the Science Academy faculty during the day. Students were integrated into the entire LBJ student body for their remaining academic and elective courses.

WHO WAS SERVED?

Admission to the Science Academy was determined by a student's satisfactory performance on a battery of admission criteria, including standardized test scores, teacher recommendations, expression of interest, and an interview with a Science Academy staff member. Because any student could obtain a transfer to LBJ in an effort to increase enrollment, once a student was selected a transfer request was approved regardless of eligibility under the stipulations of the District's transfer policy.

A total of 282 students applied to the Science Academy, of which 216 (78%) were accepted, and 193 (68%) enrolled. On the following page, Figure 11 shows the proportion of applicants who enrolled, cancelled their application before or after the selection decision was made, and those who were rejected. Figure 12 shows the proportion of enrolled students who dropped out for various reasons.

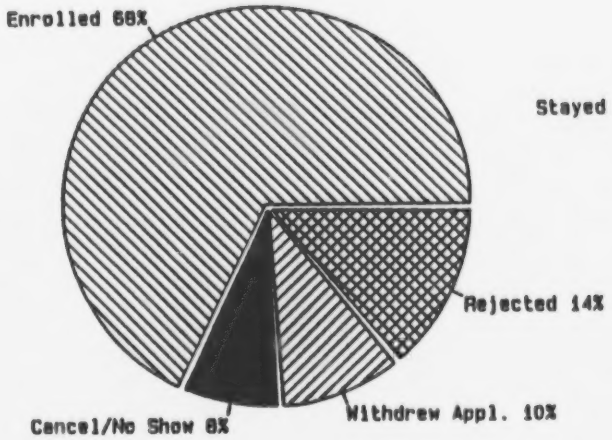


Figure 11. SCIENCE ACADEMY APPLICANTS, 1985-86.

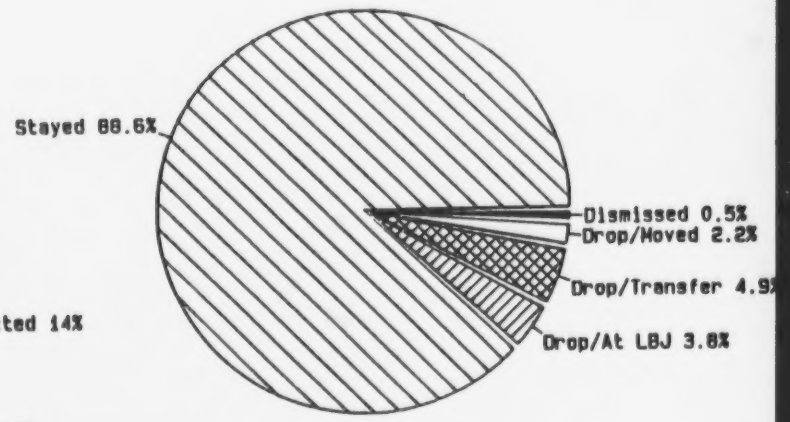


Figure 12. ENROLLMENT STATUS BY END OF YEAR.

Figure 13 below summarizes the ethnic, sex, and low-income status of the students who were still enrolled as of April, when the last count was taken.

ETHNICITY			SEX		PERCENT
BLACK	HISPANIC	OTHER	MALE	FEMALE	LOW-INCOME
33	12	123	122	46	11
20%	7%	73%	73%	27%	7%

Figure 13. CHARACTERISTICS OF SCIENCE ACADEMY STUDENTS.

HOW DID SCIENCE ACADEMY STUDENTS COMPARE TO OTHER STUDENTS DISTRICTWIDE IN TERMS OF ACHIEVEMENT?

UPON ENTERING?

The criteria used to select applicants for the Science Academy required that their standardized test percentile scores in mathematics and reading should sum to at least 140, and no subtest total percentile score should be below the 50th percentile. In general, the Science Academy applicants scored well above students districtwide on all subtests of the ITBS or TAP. The figures on the next page show the 1984-85 and 1985-86 median grade equivalent and percentile scores for eighth- and ninth-grade applicants who were accepted compared to students districtwide by ethnicity.

	SCIENCE ACADEMY ENROLLEES		DISTRICTWIDE	
	GRADE EQUIV.	PERCENTILE	GRADE EQUIV.	PERCENTILE
READING				
Black	10.25	78	7.67	33
Hispanic	10.35	80	7.77	36
Anglo	11.40	93	9.84	71
TOTAL	11.20	91	8.89	54
MATHEMATICS:				
Black	9.95	77	7.78	32
Hispanic	10.15	81	8.12	39
Anglo	10.80	92	9.52	69
TOTAL	10.60	88	8.82	54

Science Academy: Black=16, Hispanic=10, Anglo=111

Figure 14. 1985 ITBS MEDIAN GRADE EQUIVALENT AND PERCENTILE SCORES FOR STUDENTS DISTRICTWIDE AND SCIENCE ACADEMY ENROLLEES IN THE NINTH-GRADE IN 1985-86. There is no science subtest on the ITBS for which to report previous levels of achievement.

	SCIENCE ACADEMY ENROLLEES		DISTRICTWIDE	
	GRADE EQUIV.	PERCENTILE	GRADE EQUIV.	PERCENTILE
READING:				
Black	13.20	76	8.07	29
Hispanic	*	*	8.62	36
Anglo	16.20	91	12.26	70
TOTAL	15.90	90	10.23	54
MATHEMATICS:				
Black	14.40	83	7.95	25
Hispanic	*	*	8.59	32
Anglo	16.20	92	12.52	72
TOTAL	14.90	86	10.55	55
SCIENCE:				
Black	13.20	77	7.64	26
Hispanic	*	*	8.28	33
Anglo	16.10	95	11.98	69
TOTAL	15.30	90	10.14	53

Science Academy: Black=15, Hispanic= 5, Anglo=30

Figure 15. 1985 TAP MEDIAN GRADE EQUIVALENT AND PERCENTILE SCORES FOR STUDENTS DISTRICTWIDE AND SCIENCE ACADEMY ENROLLEES IN THE TENTH-GRADE IN 1985-86. There were too few Hispanic tenth-grade Science Academy students to report reliable results.

At the time applications were submitted, eighth-grade students accepted into the Science Academy:

- Scored an average of 37 percentile points above the District median percentiles for all students in reading on the ITBS (91st percentile versus 54th).
- Scored an average of 34 percentile points above the District ITBS median percentile in mathematics (88th versus the 54th).

Ninth-grade applicants:

- Scored an average of 36 percentile points higher than the District TAP median percentile score in reading (90th versus the 54th).
- Scored an average of 31 percentile points higher than the District TAP median percentile score in mathematics (86th versus the 55th).

BY END OF YEAR?

At the end of the year, regression analyses known as ROSE, Report On School Effectiveness, were done on the ninth- and tenth-grade TAP mathematics and science grade equivalent scores in order to compare the achievement of Science Academy students to similar, high-achieving students districtwide. Several characteristics were taken into consideration for finding similar, high-achieving students, such as previous achievement level, sex, ethnicity, low-income status, and desegregation status.

Because the ITBS does not have a science subtest, total battery grade equivalents were used as pretest scores for comparing with the ninth-grade TAP science score. Tenth-grade TAP scores were compared with the students' 1985 TAP scores. Figures 16 and 17 graphically represent how the Science Academy students achieved in science and mathematics compared to the performance of students with similar characteristics who were not in the program.

The following graphs show that the Science Academy students made large gains during the year. In addition, they made slightly larger gains than their high-achieving counterparts districtwide. It should be noted that the tenth-grade science gains for the Science Academy students are not significantly larger than the gains for the similar, high-achieving students. The Science Academy administration proposed that the tenth-grade Science Academy students did not have sufficient opportunity to demonstrate mastery in the science content areas they studied during the year (primarily chemistry and physics). Because of a change in the science course sequence at the ninth- and tenth-grades that took effect in 1985-86, some Science Academy students had biology in 1984-85 and some have not had biology at all. (This effect is unlikely to recur.) Only 32% (1st sem.) and 20% (2nd sem.) of the tenth-grade Science Academy

science enrollments were in biology during 1985-86. By comparison, 58% of tenth-grade science enrollments districtwide were in biology during 1985-86, and very few had chemistry or physics. However, the TAP science subtest is heavily loaded on biology items (37% of all items) and has very few on chemistry (3%) or physics (3%) items. The Science Academy director suggested that administering a higher level of the science TAP may help remedy this curriculum-test mismatch, as the higher levels have more chemistry and physics items than the lower levels.

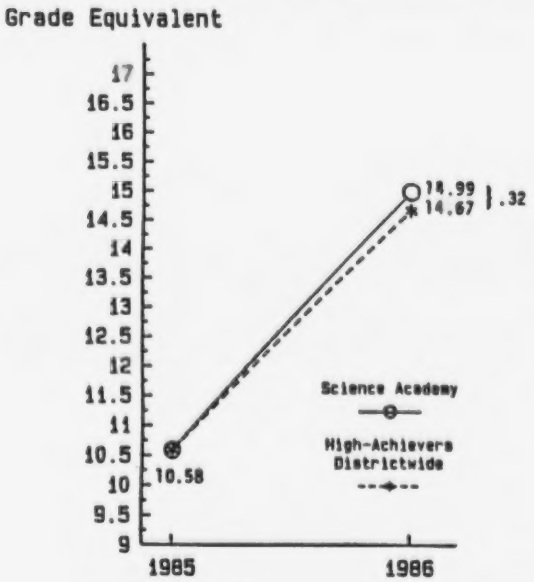


Figure 16a.
Ninth-Grade Mathematics Achievement

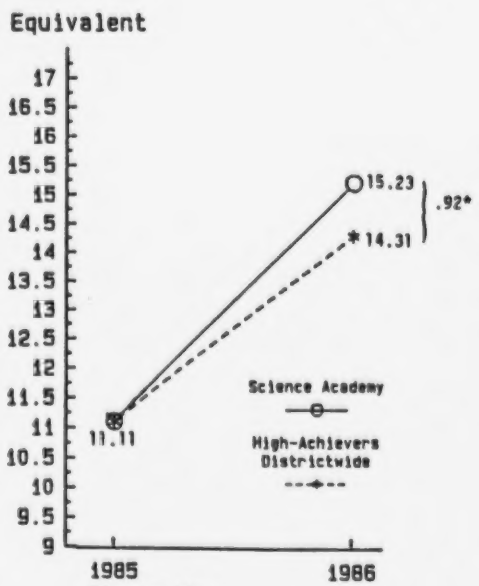


Figure 16b.
Ninth-Grade Science Achievement
*Statistically significant difference

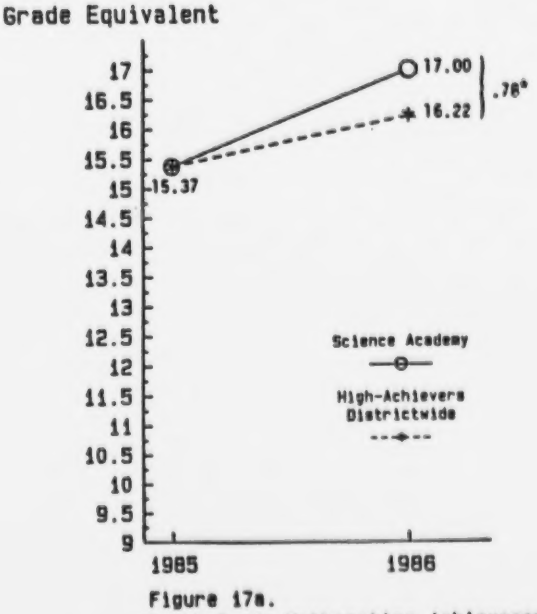


Figure 17a.
Tenth-Grade Mathematics Achievement
*Statistically significant difference

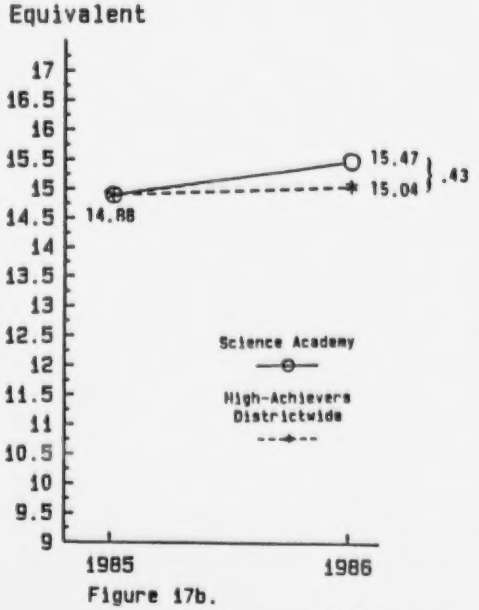


Figure 17b.
Tenth-Grade Science Achievement

Attachment 1 provides additional achievement information about the students who remained enrolled in the Science Academy throughout the 1985-86 academic year.

WHAT WAS THE COST PER PUPIL AT THE SCIENCE ACADEMY?

Because the capital outlay portion of the total allocation was so large, straight-line depreciation was calculated based on a five-year life expectancy of capital outlay assets. Furthermore, the costs had to be represented as being within a range, because teachers funded by the magnet program also provided services to regular LBJ students. Two methods were used to calculate the proportion of teachers' salaries which were exclusively for the Science Academy. In the first method (I), the proportion was based on the ratio of Science Academy classes to total classes for each teacher. The second method (II), was based on the four teachers' salaries that could be considered as "add-on" costs to the District because of the program. The salaries of five of the nine teachers were previously paid out of local funds but were assumed by the magnet program. In both methods, the salaries for two administrators and a secretary were considered to be "add-on" costs.

Because Science Academy students arrived early for a zero-hour period, it was necessary for the District to provide transportation for most of the students. When considering the following figures, it should be remembered that the local magnet costs represent expenses over and above the cost normally expended by AISD per student.

SOURCE	ADJUSTED ALLOCATION	STUDENTS SERVED	MAGNET COST PER PUPIL
LOCAL (I)	$348,275	174	$2,277.44
(II)	$270,100	174	$1,828.16
FEDERAL	$109,151	174	$ 627.30
TOTAL (I)	$457,426	174	$2,904.74
(II)	$379,251	174	$2,455.46
+TRANS.	$228,514	114	$2,004.51

Figure 18. SCIENCE ACADEMY PER-PUPIL COST BASED ON BUDGET ALLOCATIONS. Note: The cost to AISD is to be interpreted as lying within a range between the method (I) and (II) figures.

The cost to the District is projected to decrease as more students are admitted, because several courses had enrollments below the preferred 20:1 pupil-teacher ratio. Unfortunately, the value of the contributions the Science Academy or any magnet program makes to the District cannot be calculated as a benefit of incurring the extra cost of these programs. A few areas in which the Science Academy has already had an effect on AISD

include: new and revised curriculum units, outstanding teachers being attracted to AISD (including to other campuses), new scientific equipment, staff development for District teachers, and national recognition as an exemplary program.

ATTITUDES TOWARD THE SCIENCE ACADEMY

A 28-item survey was distributed to Science Academy students in April 1986, and 143 (86%) were completed and returned. No make-ups were offered. The results of the student survey indicated:

- More than half of the students felt motivated either by being with students with similar interests or just by being in the Science Academy.
- Most of the students (80%) plan to go to college and are considering a career in a science, mathematics, or technology field.
- Students who thought that the courses were difficult also tended to think that the teachers expected too much from the students. Students with a high grade point average tended to think the courses were easy.
- **Eighty-six percent reported that they would encourage other interested students to apply.**
- Students felt less prepared in study skills than in subject areas. Only 25% felt better than adequately prepared, and 30% felt poorly or not at all prepared in study skills, compared to fewer than 20% in all other academic areas.

Students were also asked to respond to open-ended questions about what they liked and disliked about the Science Academy. While academic topics represented over half of the positive comments, academics also received the largest portion (36%) of unfavorable comments. Students also focused on teachers and social aspects of the program in their comments about what they disliked (24% and 23% of the comments, respectively).

ADMINISTRATOR AND TEACHER ATTITUDES

Questions about the magnet programs were sent to administrators and teachers at the magnet campuses as part of an annual survey conducted by the Office of Research and Evaluation. Twelve administrators and seventy-one teachers at magnet campuses responded. In addition, several secondary mathematics and science teachers were also surveyed. In general, the results indicated the following:

- Ninety-two percent of the administrators and 80% of the teachers thought that students' interests were being satisfied by the magnet curriculum.
- Half of the administrators and teachers thought that the programs offered teachers greater flexibility in teaching the curriculum.
- More than half of the administrators (67%) and teachers (52%) held the opinion that the programs created extra work for teachers.
- Because of the magnet programs, 67% of the administrators, 70% of the elementary teachers, and all the secondary teachers reported that their motivation had increased.

DID THE PROGRAMS MEET THEIR OBJECTIVES IN CURRICULAR AND INSTRUCTIONAL ACTIVITIES?

The magnet school grant also provided funds to pay teachers stipends for participating in staff development or for curriculum writing and planning. Each campus submitted planning sheets outlining general activities in the areas of curriculum and staff training that would best meet their unique needs. Information about the activities that occurred at each campus was obtained from purchase requisitions that were submitted for payment of teacher stipends and from the administrator of each program.

The foreign language program failed to meet its staff development objectives because the VCR and computer equipment were not available on time for training use. Also, because it is unknown whether the program will exist next year (it is highly probable that it will not), training was not done because many of the language teachers had submitted requests to be transferred to another school. The conclusion was that staff development would no longer be a wise use of the money given the uncertain situation of the program. Instead, the money was used to purchase additional instructional materials.

Figure 19 on the following page presents a summary of each elementary campus' involvement in curricular activities and staff development. (The Science Academy activities in curriculum and instruction are presented in a following section which addresses the impact of the program on the District's science curriculum.) Under each heading, the numbers represent the total amount of time, if known, devoted to that activity. The evaluation of the status of the objectives (in the last column) was made by comparing the stated objectives to quantitative and qualitative information gathered from documents and interviews.

CAMPUS	CURRICULUM	STAFF DEVELOPMENT CONFERENCES	STAFF DEVELOPMENT INSERVICE	OBJECTIVES MET?
BROOKE	9 Field Trips, 817 Part-Time Teacher Hours	25 Days	--	Partially Met
BRYKER WOODS	690 Hours for Writing/Planning	56 Days	280 Hours	Yes
GULLETT	11 Modules Written	72 Days	--	Yes
HIGHLAND PARK	593 Hours Writing	--	859 Hours	Yes
ORTEGA	112 Hours Writing	43 Days	112 Hours	Exceeded
SIMS	3 Field Trips	12 Days	442 Hours	Exceeded
MURCHISON	none	none	none	Did Not Meet
SCIENCE ACADEMY	Curriculum skills training/writing; Total unknown	4 staff; Days unknown	2,000 Hours approx.	Exceeded

Figure 19. SUMMARY OF CURRICULAR AND STAFF DEVELOPMENT ACTIVITIES TOWARD MEETING PROGRAM OBJECTIVES

HOW HAVE THE MAGNET PROGRAMS IMPACTED THE DISTRICT?

In Terms of Enrollment and Ethnicity?

The enrollment by ethnicity was examined at each campus over a seven-year period. Since AISD implemented its desegregation plan in 1980-81, enrollment at seven of the eight campuses had been declining. Trends generally began to reverse with the introduction of magnet programs. The enrollment data indicated the following.

- All six elementary campuses increased in enrollment during either the first or second year of the magnet programs.
- In general, the enrollment at the six elementary schools has stabilized over the last three years (83-84 through 85-86). The magnet schools may have contributed to this, but there may have been other factors involved as well.

- LBJ showed its first increase in enrollment (+14%) since desegregation with the implementation of the Science Academy.

- Because Murchison admitted only nine magnet transfer students, there were too few to affect enrollment or ethnic balance.

- After desegregation impacted the schools, ethnic distributions remained relatively stable. Attachment 2 shows the percent minority enrollment at the schools for the past seven years. The reasons for the slight fluctuations may be the result of several influences, one of which might be the ethnicity of the magnet transfer students.

While conclusive statements about the impact of magnet schools on enrollment cannot be made because other District programs and policies affect a school, it does appear that the magnet programs were impacting the schools in a positive way. Attachment 3 shows the enrollment at each magnet campus over the seven year period from 1979-80 to 1985-86.

In Terms of Transfers?

- As the magnet schools have gained in popularity, the number of magnet transfers has increased. The largest increases occurred between the first and second years of the programs.

- A total of 765 elementary magnet transfers have been granted since the programs were first implemented.

- On a per school basis, transfers from overcrowded south Austin schools have been granted at a higher rate than from other schools, which is consistent with the purpose of the magnet schools. The 16 south Austin elementary schools (south of the Colorado River) have contributed 44% of the total magnet transfers, or an average of 21 per school compared to an average of nine for all remaining elementary campuses.

- Elementary magnet transfer students comprised from 4% to 22% of a school's total enrollment, with the average at 11.5%.

- Science Academy students represented nearly 15% of the total enrollment at LBJ; the magnet transfer students alone accounted for 10%. Almost 73% of all Science Academy students transferred from other schools.

In Terms of Enrollment in High School Honors Courses?

Enrollment in honors courses at the other high schools was examined to determine if the Science Academy impacted the schools by attracting transfer students to LBJ. The number of students taking one or more honors courses and the total enrollment for all honors courses were obtained for each campus. Assuming, then, that the Science Academy students were at their home school, enrollment estimates were calculated. A course was considered impacted if more sections would have been offered or if the course was not offered (but would have been) with the presence of the transfer students.

In general, the findings indicated no significant negative impact on the other high schools, with the exception of Johnston High School. Rather, the Science Academy had a positive impact on LBJ by increasing enrollment in honors courses. The following results were found:

- The number of students taking one or more honors courses at LBJ increased by 55% because of magnet transfers, while the average loss at the other schools was only 3.2%. At Johnston, the number decreased by 5.8%.

- Total enrollment in all honors courses at LBJ increased just over 70%, while the other schools experienced an average decrease of 4.7%. Enrollment at Johnston decreased 9.3%.

- All Science Academy students were enrolled in honors courses. Academy students accounted for 54% of all LBJ students in honors courses.

In Terms of Coordinating a K-12 Science Curriculum?

A teacher planner was funded by the magnet grant to catalog the elementary science magnet curriculum offered at each science magnet program. The objective of coordinating and articulating the curriculum across the grade levels and ultimately throughout the District began via these activities. The documentation of the curriculum was useful to the planning of the Aim High gifted and talented science program, which will be piloted in 1986-87.

While initial efforts have been made toward achieving the objective of a coordinated science curriculum, progress from the elementary levels was hampered by insufficient time and resources. There was also insufficient interest generated among the elementary program directors to have a coordinated curriculum to motivate them to devote time to the effort. Hence, much work is yet to be done.

Coordination efforts initiated by or in association with the Science Academy were successful in contributing to the overall objectives and in surpassing their own program objectives. A summary of major activities and contributions follows:

- The Science Academy director worked with the Kealing principal for planning and preparing the scope and sequence of the junior high science magnet curriculum. Kealing teachers were paid stipends for summer curriculum writing.
- Science Academy teachers conducted staff development sessions for Kealing teachers and for the Region XIII Service Center.
- As a result of workshops, other AISD teachers have requested copies of the science curriculum. Other districts have also requested copies.

HOW DID AISD'S PROGRAMS COMPARE TO OTHER PROGRAMS NATIONWIDE?

The Department of Education distributed $75,030,000 in 1985-86 under the Magnet Schools Assistance Program to 44 districts nationwide. General information about other districts' programs was available from the Department of Education and was distributed at a magnet program conference held in Washington, D.C. Descriptive statistics were calculated from the information reported for each district to compare AISD's grant program with the programs of other grant recipients. The information was summarized as follows:

- The average grant amount awarded was $1,705,227. AISD's award of $963,950 ranked 24th in terms of the dollar amount (ranked from high to low).
- Of the districts reporting an estimated number of students served, the average was 4,522, and the median was 3,000. AISD had originally estimated that 3,800 students would be served but actually served 1,958.
- The average number of schools served was six elementary and three secondary. The medians were three and two respectively.
- AISD's programs addressed seven different curriculum areas districtwide, compared to an average of 4.79 areas nationwide. Science/technology programs were the most frequently offered.
- The per pupil allocation, based on the grant amount divided by the estimated number of students served, averaged $645 across the nation. Austin's estimated per pupil allocation was $253.67, more than half a standard deviation below the mean.

Even with a smaller than average grant award, AISD was very competitive compared to the other 43 districts that received grants in the number of schools and students served and offered a better than average variety of curriculum areas, and AISD funded its magnet programs at an estimated per pupil cost which was below the estimated national average.

Bibliography

Gaines, M. L. (1986). Magnet Schools Assistance Program: 1985-86 Technical Report (ORE Pub. No. 85.41). Austin, TX: Office of Research and Evaluation, Austin Independent School District.

GRADE 9	SCIENCE ACADEMY Grade Equivalent 85	86	diff.	Percentile 85	86	DISTRICTWIDE Grade Equivalent 85	86	diff.	Percentile 85	86
READING:										
Black	10.10	14.40	+4.30	76	83	7.67	8.21	+ .54	33	31
Hispanic	10.50	13.20	+2.70	82	76	7.77	8.67	+ .90	36	37
Other	11.50	16.50	+5.00	93	92	9.84	12.25	+1.69	71	69
TOTAL	11.30	15.90	+4.60	91	90	8.47	10.16	+1.69	54	53
MATHEMATICS:										
Black	10.00	13.40	+3.40	78	77	7.67	8.27	+ .60	33	29
Hispanic	9.90	13.90	+4.00	76	80	7.77	8.86	+1.09	36	36
Other	10.90	16.40	+5.50	92	93	9.84	12.38	+1.63	71	71
TOTAL	10.70	16.00	+5.30	90	91	8.89	10.52	+1.63	54	55
SCIENCE:										
Black	--	14.30	--	--	84	--	7.86	--	--	29
Hispanic	--	14.05	--	--	83	--	8.50	--	--	35
Other	--	16.40	--	--	96	--	11.69	--	--	69
TOTAL	--	16.10	--	--	95	--	10.19	--	--	53

Science Academy: Black=15, Hispanic=9, Other=85

Attachment 1a: 1985 AND 1986 MEDIAN GRADE EQUIVALENT AND PERCENTILE SCORES FOR STUDENTS DISTRICTWIDE AND NINTH-GRADE SCIENCE ACADEMY STUDENTS WHO WERE ENROLLED THE ENTIRE YEAR.

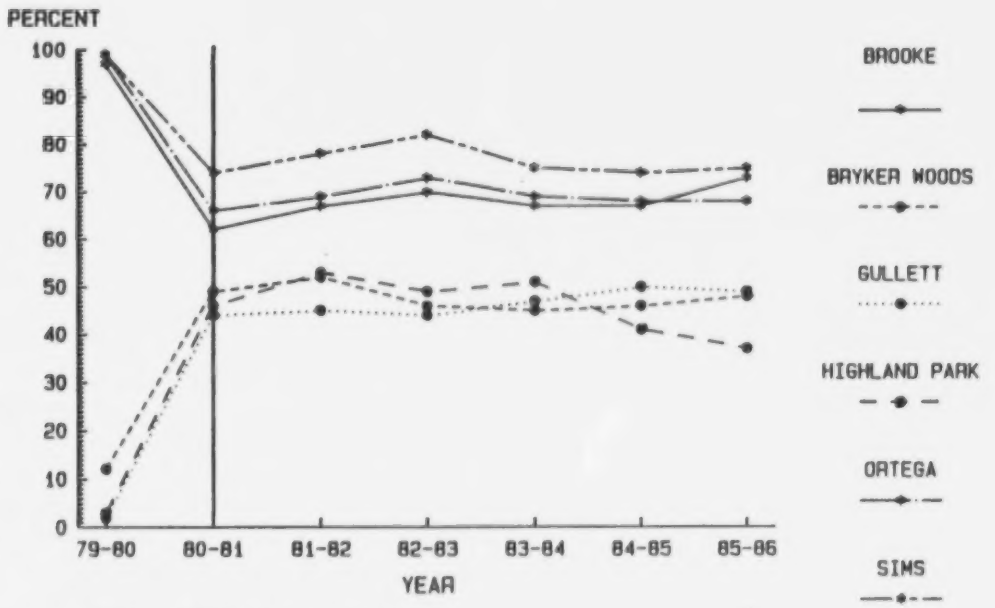
GRADE 10	SCIENCE ACADEMY Grade Equivalent 85	86	diff.	Percentile 85	86	DISTRICTWIDE Grade Equivalent 85	86	diff.	Percentile 85	86
READING:										
Black	15.20	14.80	- .40	87	78	8.07	9.81	+1.74	29	40
Hispanic	*	*	*	*	*	8.62	10.55	+1.93	36	47
Other	16.20	18.00	+1.80	91	92	12.26	14.18	+1.92	70	74
TOTAL	15.90	17.30	+1.40	90	90	10.23	12.65	+2.42	54	64
MATHEMATICS:										
Black	14.40	15.50	+1.10	83	82	7.95	9.80	+1.85	25	39
Hispanic	*	*	*	*	*	8.59	11.09	+2.50	32	50
Other	16.40	18.10	+1.70	93	95	12.52	14.19	+1.67	72	74
TOTAL	15.20	17.20	+2.00	88	91	10.29	12.64	+2.35	55	62
SCIENCE:										
Black	13.40	14.40	+1.00	78	77	7.64	9.81	+2.17	26	38
Hispanic	*	*	*	*	*	8.28	10.41	+2.13	33	45
Other	16.10	16.20	+ .10	95	89	11.98	13.67	+1.69	69	72
TOTAL	15.30	16.00	+ .70	90	88	10.14	12.28	+2.14	53	61

Science Academy: Black=13, Hispanic=< 5, Other=23

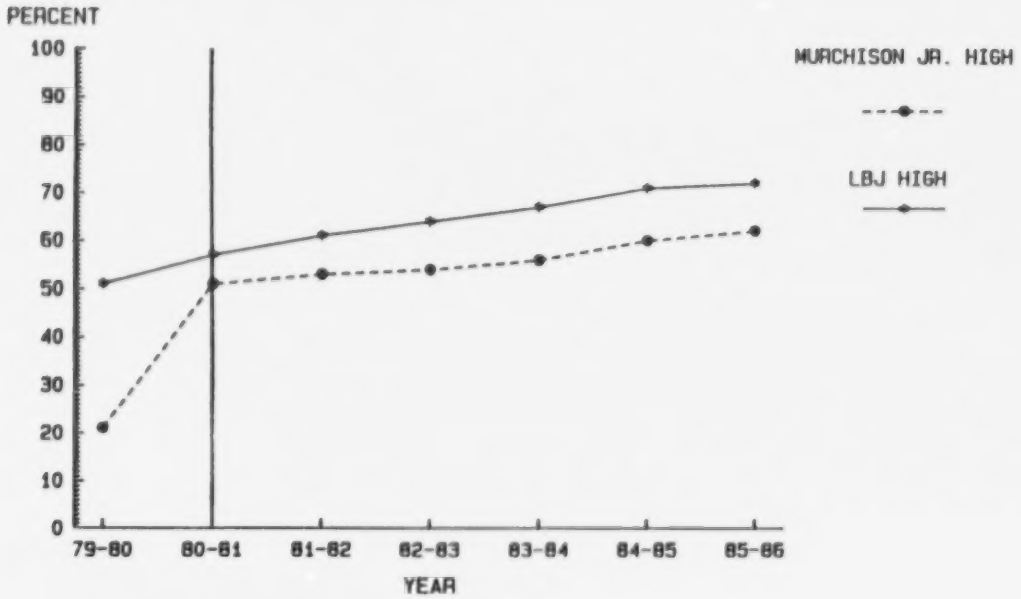
Attachment 1b: 1985 AND 1986 MEDIAN GRADE EQUIVALENT AND PERCENTILE SCORES FOR STUDENTS DISTRICTWIDE AND TENTH-GRADE SCIENCE ACADEMY STUDENTS WHO WERE ENROLLED THE ENTIRE YEAR.

Attachment 2

PERCENT MINORITY ENROLLMENT AT MAGNET CAMPUSES 1979-80 THROUGH 1985-86



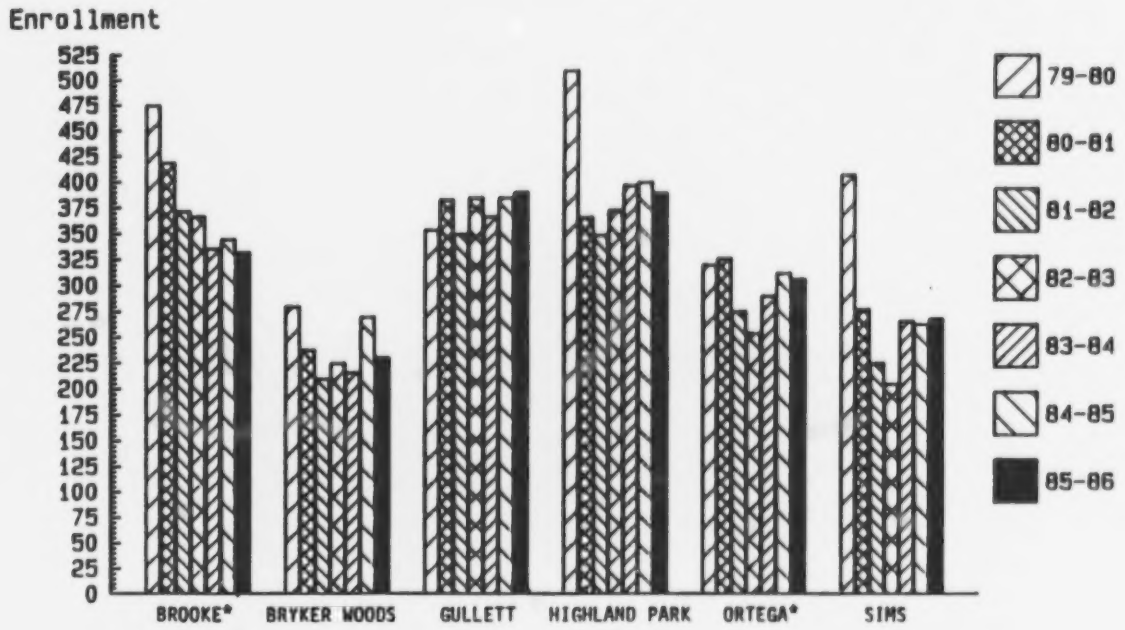
MINORITY ENROLLMENT AT ELEMENTARY MAGNET CAMPUSES, 1979-80 TO 1985-86.



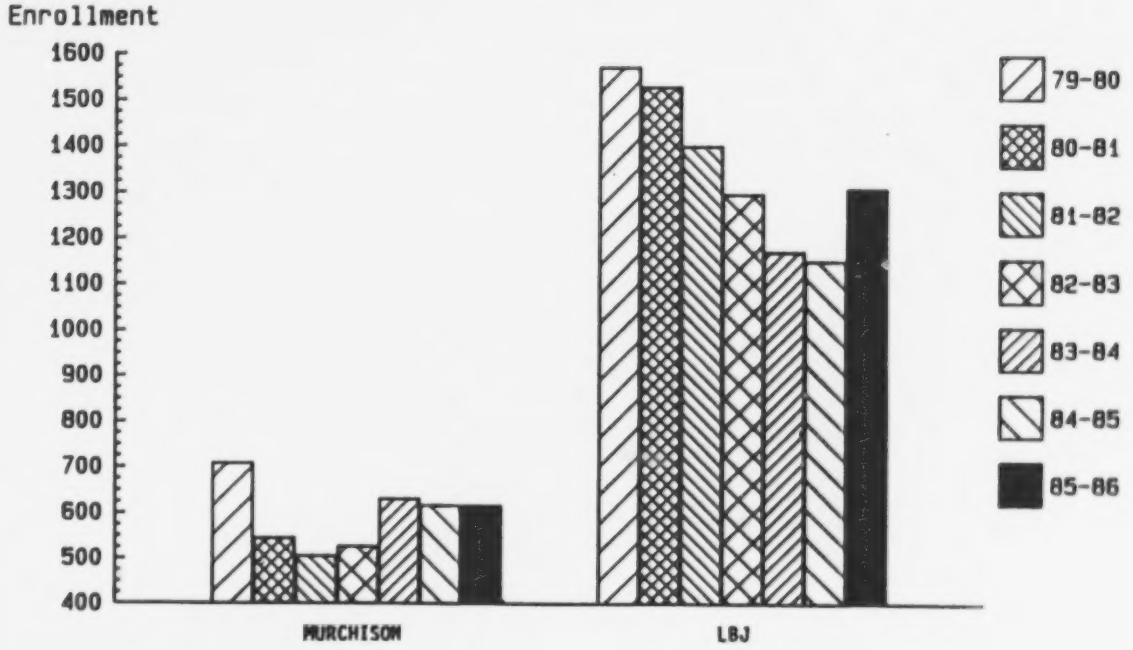
MINORITY ENROLLMENT AT SECONDARY MAGNET CAMPUSES, 1979-80 TO 1985-86.

1980-81 Desegregation Begins

MAGNET SCHOOL CAMPUS ENROLLMENT: LONGITUDINAL BY YEAR



1980-81 Desegregation Begins
1982-83 Science Magnets Begin
1983-84 Humanities* Magnets Begin



1980-81 Desegregation Begins
1985-86 Foreign Language Magnet Begins
1985-86 Science Academy of Austin Begins

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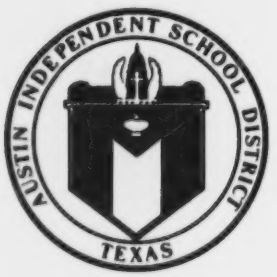

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